BAY AREA AIR QUALITY MANAGEMENT DISTRICT

LEHIGH SOUTHWEST CEMENT PLANT
BAAQMD Site #A0017
24001 Stevens Creek Boulevard
Cupertino, CA 94014

FACT SHEET

March 5, 2012

Background

- The Lehigh Southwest Cement Plant is located in unincorporated Cupertino at the end of Stevens Creek Boulevard. Mining at the site dates back to the 1880's, and the cement plant was established in 1939.

- The facility excavates limestone from an on-site quarry for use as a raw material in cement manufacturing. The limestone, and other raw materials, are crushed into a fine powder and blended in the correct proportions. This blended raw material is heated in a pre-heater and rotary kiln where it reaches temperatures of about 2,800 degrees Fahrenheit. The fuel used to heat the kiln is currently petroleum coke. The material formed in the kiln, known as "clinker", is cooled and then ground and blended with gypsum to form Portland cement. In addition to cement, the facility also produces and sells construction aggregates.

- Nitrogen oxides (NO_x), sulfur dioxide (SO_2), and particulate matter (PM), are the primary criteria air pollutants emitted from cement manufacturing. Small quantities of volatile organic compounds (VOC), including the toxic air contaminant (TAC) benzene, are also emitted from the kiln. TAC emissions also include trace metals such as mercury, cadmium, chromium, arsenic, and nickel, and hydrochloric acid (HCl). The kiln exhaust is equipped with continuous emissions monitors (CEMs) to determine compliance with applicable emission limitations, and pollutants with CEMs include NO_x and SO_2. A CEM has also recently been installed to determine mercury emissions from the kiln exhaust.

- PM and metallic TAC emissions are controlled at the facility by fabric filtration, which is used at various material crushing, grinding, and loading operations, and at the kiln, which is the largest source of emissions. Additional emission controls, which focus on controlling mercury emissions, include a kiln mill dust collector (KMDC) dust shuttling system (operational since May 2010), and an activated carbon injection (ACI) system (operational since May 2011). A lime slurry injection (LSI) system has also been installed to reduce emissions of HCl and visible emissions.

- Lehigh is subject to a number of Bay Area Air Quality Management District ("District"), State, and federal air quality rules and regulations that are delineated in the facility's Title V Permit. A Title V Permit is a compilation of all existing air quality requirements that apply to a stationary source (facility) including emissions limits and standards, monitoring, record keeping, and reporting requirements.

- In 2007, Santa Clara County began a process to amend Lehigh's Reclamation Plan, which is required under the State's Surface Mining and Reclamation Act (SMARA) to ensure compliance with State and local mining laws. The County is acting as the Lead Agency under the California Environmental Quality Act (CEQA) for this action, and issued a Draft Environmental Impact Report (DEIR) for the project on December 23, 2011, with a public comment period extending through February 21, 2012. The project description for the Reclamation Plan Amendment in the DEIR has been revised to exclude a new quarry pit, which had been a component included in previous proposals issued.

Public Comments/Issues

- In November 2007, District staff met with representatives of the West Valley Citizen Air Watch (WVCAW) and worked to answer questions from the group and other members of the public about the Quarry Reclamation Plan Amendment proposal, and other air quality issues associated with the facility.

- On October 22, 2008, and June 11, 2009, District staff participated in community meetings organized by Santa Clara County to answer questions about the facility and the Reclamation Plan Amendment. A variety of concerns were expressed at these meetings including the potential location of a new quarry pit close to residential areas, the use of petroleum coke as a fuel, visible emissions from the kiln, general dust emissions and particulate deposition, emissions of toxic air contaminants including mercury and hexavalent chromium, emissions from truck traffic, and the facility's compliance history.

- The District conducted a public hearing in Cupertino on September 17, 2009, to solicit comments on the draft Title V permit renewal for the Lehigh facility. Approximately one hundred individuals or groups provided comments at the hearing, and many additional comments were received in writing.

- Members of the public have raised concerns regarding an Notice of Violation (NOV) issued by the U.S. EPA to the Lehigh facility on March 9, 2010, for alleged violations of the Clean Air Act's Prevention of Significant Deterioration (PSD) permit program. The NOV was part of a national review of PSD applicability for the cement manufacturing industry.

Facility Status

A. Permits

- Lehigh's initial Title V permit was issued on November 5, 2003. Title V permit renewals are required every five years, and the existing Title V permit continues in force until the District takes final action on the renewal application. On July 30, 2009, the District issued an initial draft Title V permit renewal for the Lehigh facility. On

January 5, 2010, the District withdrew this initial draft Title V permit renewal. This was done because EPA had proposed significantly more stringent standards for mercury and other TACs from cement plants in amendments to 40 CFR 63, Subpart LLL, National Emission Standards for Hazardous Air Pollutants (NESHAP) from the Portland Cement Manufacturing Industry. The proposed EPA NESHAP amendments were published on May 6, 2009, and the final amendments were published on September 9, 2010 (the emission standards of the amended NESHAP do not become effective, however, until September 9, 2013). The requirements of this amended NESHAP were incorporated into a revised draft Title V permit renewal, and the draft permit and Statement of Basis were re-issued by the District for public comment on January 7, 2011, with the comment period ending on March 25, 2011. Since that time, District staff has responded to public comments and posted the responses to the District website. The draft Title V permit renewal, including the Statement of Basis and responses to comments, was submitted to EPA on February 16, 2012 for a 45-day review period which ends March 31, 2012. Final action on the Title V permit renewal will be taken after considering any comments received from EPA.

- On May 3, 2011, the District issued a permit for the operation of an Activated Carbon Injection system to control mercury emissions from Lehigh's cement kiln. On July 8, 2011, the District issued a minor revision to incorporate these additional controls and emission limits into Lehigh's Title V permit. On October 17, 2011, the District issued a permit for two synthetic gypsum feeders. On January 9, 2012, the District issued a minor revision to incorporate the applicable requirements for these sources into Lehigh's Title V permit.

B. Compliance

- From July 1, 2004 through December 31, 2011, there were 33 violations at the Lehigh facility that resulted in the issuance of 27 Notices of Violation (NOVs) by the District. The violations can be characterized as emissions-related, administrative, or permit-related in nature. There were 19 emissions-related violations; most were issued for excessive visible emissions of dust or smoke from various facility sources. The facility expeditiously took corrective action and brought these violations into compliance. There were eight administrative violations, which included various recordkeeping deficiencies and late reporting of required reports. Lehigh took corrective action on these violations and brought them into compliance. The six permit-related violations documented unpermitted material stockpiles and synthetic gypsum feeders. Lehigh has obtained the necessary permits and is currently in compliance with District permit requirements. Staff is currently investigating several SO_2 excesses from the cement kiln reported by the facility in September and October 2011. SO_2 excesses had not previously been a compliance issue during this review period. In summary, Lehigh has been in intermittent compliance, similar to many other Title V facilities; there is currently no ongoing violation, or pattern of recurrent violation that represents ongoing noncompliance.

- The NOV issued by U.S. EPA to Lehigh on March 9, 2010, concerns a series of physical modifications made to the facility between 1996 and 1999. EPA alleges that these modifications should have undergone pre-construction PSD permit review, but the owners of the facility at the time failed to apply for a PSD permit, which would have required additional emissions controls for NO_x and SO_2. This NOV is similar to other EPA enforcement actions against various cement plants in other states. EPA has recently informed District staff that the Lehigh NOV remains an active investigation by EPA without final resolution.

- EPA did not include in its NOV any projects at the Lehigh facility that occurred after EPA adopted major reforms to the PSD regulations on December 31, 2002. According to EPA, "[t]hese reforms were aimed at providing much needed flexibility and regulatory certainty, and at removing barriers and creating incentives for sources to improve environmental performance through emissions reductions, pollution prevention, and improved energy efficiency" (*Supplemental Analysis of the Environmental Impact of the 2002 Final NSR Improvement Rule*, U.S. EPA, Nov. 21, 2002). The reforms modified PSD applicability tests which, in some cases, had resulted in projects being identified as a major modification even though the project decreased emissions (because of the program's "actual-to-potential" applicability test and "last two years" baseline emissions procedure, both of which were eliminated with the reforms).

C. Toxic Air Contaminants

- District staff has conferred with staff of Monterey Bay Unified Air Pollution Control District (MBUAPCD) and South Coast Air Quality Management District (SCAQMD) regarding the reason for elevated levels of hexavalent chromium reported downwind of cement plants located in Davenport and Oro Grande, California. It is believed that these elevated hexavalent chromium levels are the result of the use of steel slag as a raw material and/or the use of uncovered clinker storage piles. The Lehigh facility uses a naturally occurring iron ore that has much lower chromium levels than steel slag, and also utilizes enclosed silos rather than open storage piles for clinker storage.

- The District required that Lehigh collect additional data regarding hexavalent chromium, mercury, other metallic TACs, and crystalline silica, in fugitive dust and other sources at the facility in addition to the kiln. This comprehensive TAC emissions inventory update was submitted to the District on March 30, 2009. After review of these data, the District required Lehigh to revise mercury emission estimates from the kiln by using a more conservative material balance approach (the prior approach for estimating mercury emissions had been based on stack testing as specified in State guidelines). Lehigh was then required by the District to prepare a comprehensive updated Health Risk Assessment (HRA), based on the revised TAC emissions inventory, under the requirements of the state Air Toxics Hot Spots (ATHS) program. The HRA was required to be based on recently updated HRA guidelines issued by Cal/EPA's Office of Environmental Health Hazard Assessment

(OEHHA) in accordance with the mandate of the Children's Environmental Health Protection Act. Revised HRA procedures include more health protective Reference Exposure Levels (RELs) for mercury and several other TACs, and the use of age sensitivity factors for estimating cancer risks.

- The updated HRA was submitted by Lehigh in September 2010, and District staff subsequently noted several discrepancies and/or errors and requested revisions. A revised HRA was submitted in March 2011. The HRA included multiple emissions scenarios, including a "2011 Production" scenario that considers additions of sorbent (lime and activated carbon) injection to the kiln abatement system that have been implemented, as well as a projected future 2013 scenario that represents additional risk reduction measures necessary to comply with the NESHAP (e.g., a new or modified kiln dust collector with a higher single exhaust stack, and tighter emission standards for mercury and other TACs).

- The updated HRA indicates that, based on the emissions represented by the 2011 Production scenario, risk levels are below the thresholds requiring public notification established by the District under the ATHS program. Risks will be further reduced based on the modifications to be made to comply with the NESHAP in 2013. Review by District staff indicated that the HRA was prepared in accordance with the ATHS program guidelines. In addition, OEHHA staff reviewed the HRA document and provided comments, but did not note any significant issues. The Lehigh facility remains a "tracking facility" under the ATHS program, and is required to periodically update their air toxics emission inventory. Changes in operation and/or increases in emission rates may require the facility to update the HRA in the future.

D. Ambient Air Monitoring

- Due to concerns about elevated hexavalent chromium air concentrations found near some cement plants, the U.S. EPA and the District installed ambient air monitoring equipment at Stevens Creek Elementary School, located approximately two miles from Lehigh, to measure hexavalent chromium as part of EPA's School Air Toxics Monitoring Initiative. The EPA provided the instruments and initial laboratory analysis, and the District installed and operated the monitoring equipment. The monitoring commenced on July 30, 2009, and continued until August 30, 2010. A total of 72 daily samples were taken at this site on a once every 6th day sampling schedule. EPA concluded that hexavalent chromium air concentrations at the site were below levels of concern for short-term and long-term exposures, and did not clearly indicate influence of a nearby source.

- On October 28, 2008, the District began operating an ambient air monitor in the vicinity of the Lehigh facility adjacent to Stevens Creek Boulevard (near the intersection of Prado Vista Drive) to determine if truck traffic and dust associated with the facility were having an adverse impact on PM levels in the nearby community. This monitor continuously recorded particulate matter of 10 microns or less (PM_{10}) in

the air. This monitor operated for approximately two years and recorded average PM_{10} levels that were less than the levels at the District's San Jose monitoring site (located about 10 miles east of the Cupertino site). Days with elevated PM_{10} concentrations at both the Cupertino and San Jose sites occurred in the wintertime PM season when wood burning has been identified as a significant source of PM air concentrations in the Bay Area.

- The District has established a comprehensive ambient air monitoring site located about three quarters of a mile from the Lehigh facility at Monta Vista Park near the intersection of South Foothill Boulevard and Voss Avenue in Cupertino. District staff participated in a community meeting to discuss the new monitoring site at the Monta Vista Community Center on April 28, 2010.

- The Monta Vista sampling site began operating on September 1, 2010, and measures air concentrations of a broad array of criteria air pollutants (e.g., $PM_{2.5}$, PM_{10}, CO, NO_2, SO_2, and ozone), TACs (e.g., a variety of metals including mercury, and a variety of organic gases including benzene), and meteorological conditions (e.g., wind speed, wind direction, and temperature). (Benzene and mercury have been identified by the District as being the primary contributors to health risk resulting from TAC emissions from the Lehigh facility).

- After collecting an entire year of data through the end of August of 2011, District staff developed a summary and analysis of the results. Portions of this follow:

  GASES: Cupertino air quality levels were well below all applicable State and National Ambient Air Quality Standards (NAAQS) for gaseous criteria pollutants including ozone, CO, SO_2, and NO_2. In general, levels of criteria pollutants were in the middle of the distribution of Bay Area air monitoring sites, with as many locations measuring levels higher as locations measuring lower than Cupertino. For ozone, levels at Cupertino were below the national standard and similar to Napa and Vallejo. (The District has been designated "non-attainment" for the state and national ambient air quality standards for ozone). NO_2 levels were similar to levels at other suburban locations, including Vallejo, Redwood City and Livermore. The same was true for SO_2 emissions with measurements similar to San Pablo and Concord. CO measurements were among the lowest in the Bay Area, with only the rural location at Bethel Island being lower.

  PARTICULATE MATTER: Ambient air quality standards have been established for $PM_{2.5}$ and PM_{10}. For both $PM_{2.5}$ and PM_{10}, there is a 24-hour standard based on daily concentrations, and an annual standard based on the average of all 24-hour concentrations over a one-year period. (The District has been designated as "non-attainment" for the 24-hour and annual state PM_{10} standards, the annual state $PM_{2.5}$ standard, and the 24-hr national $PM_{2.5}$ standard). Cupertino PM levels were among the lowest in the Bay Area, and did not exceed the 24-hour $PM_{2.5}$ NAAQS nor the 24-hour PM_{10} NAAQS, with levels similar to Redwood City and Gilroy. The annual average $PM_{2.5}$ levels were also below the NAAQS, and only slightly higher than the

more stringent annual State standard, with levels similar to, but lower than, Livermore.

LEAD: Cupertino lead levels were less than one percent of the State standard, less than 10 percent of the recently revised national standard, and less than levels in San Francisco.

TACs: The District estimated health risks using the ambient monitoring data and health effect values (cancer potency factors, and non-cancer RELs) established by OEHHA. Health risk summaries were provided as follows: cancer risk, chronic non-cancer risk, 8-hour chronic non-cancer risk, and acute non-cancer risk. Health risks were based on the following exposure pathways where applicable under OEHHA HRA guidelines: inhalation, dermal absorption, soil ingestion, mother's milk ingestion, and homegrown produce ingestion. Non-inhalation pathway exposures were estimated based on measured pollutant concentrations and conservative default exposure assumptions established in OEHHA guidelines. Per recently adopted OEHHA guidelines, the estimated cancer risks include an Age Sensitivity Factor to account for inherent increased susceptibility to carcinogens during infancy and childhood.

The calculated lifetime cancer risk at the Cupertino site was approximately 400 in one million. Compounds that contributed most significantly to cancer risk were diesel PM, benzene, 1,3-butadiene, carbon tetrachloride and formaldehyde. This is consistent with analyses of data collected at other urban monitoring sites. These pollutants are emitted primarily from mobile sources, with the exception of carbon tetrachloride. There are no known local sources of carbon tetrachloride due to the phase-out of this compound as a stratospheric ozone-depleting compound. Measured levels of carbon tetrachloride in Cupertino are consistent with global background levels observed at other monitoring sites.

Estimated chronic non-cancer risk was represented by hazard quotient and hazard index. A hazard quotient is the ratio of the observed concentration of a particular compound to the compound's REL. RELs are concentrations at or below which no adverse non-cancer health effects are anticipated to occur in the general human population, including sensitive individuals. The hazard index is taken as the sum of the hazard quotients for each compound that affects the same target organ system (e.g., respiratory system, nervous system, etc.). A hazard index at or below 1 indicates that no adverse effects would be anticipated to occur. A hazard index above 1 does not necessarily indicate adverse health effects.

The 8-hour hazard indices were based on concentrations for the normal 8-hour exposure period for workers, and for children at schools and daycare facilities, that are repeated over an annual period. Note that 8-hour monitoring data are not available, but these concentrations were conservatively estimated by assuming that the entire 24-hour sample was collected over a single 8-hour period (i.e., 8-hour concentrations were assumed to be three times the measured 24-hour

concentration). The acute hazard indices were based on maximum concentrations for a 1-hour period. Note that 1-hour monitoring data are not available, but these concentrations were conservatively assumed to be 7.5 times the maximum 24-hour concentration.

The chronic hazard index based on Cupertino air monitoring data was about 1. The 8-hour chronic hazard index, and the acute hazard index, were both less than 1.

E. Other Activities

- District staff participated in Study Sessions held by the Cupertino City Council to discuss issues associated with the Lehigh facility on January 12, 2010, and July 20, 2010.

- District staff participated in Public Information Forums held by the Town of Los Altos Hills to discuss the Lehigh facility on June 6, 2011, and January 6, 2012. At the most recent Public Information Forum, consultants for the Town summarized the findings of their review of the updated HRA completed for the Lehigh facility, and indicated that no significant deficiencies had been identified

- District staff has begun rule development on Stationary Source Measure 9: Cement Kilns, from the District's 2010 Clean Air Plan (CAP). This rule development project is evaluating more stringent standards for NO_x emissions and other air pollutants for the Lehigh facility. A draft rule (District Regulation 9, Rule 13) was issued on November 17, 2011, and a public workshop was held on December 12, 2011 at the Monta Vista High School in Cupertino. Staff is expected to present the rule to the District's Board of Directors for consideration of adoption in the second quarter of 2012.